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Claims

1. Recombinant enzymatically active glucocerebrosidase produced by a eukaryotic cell.

2. The glucocerebrosidase of claim 1, produced by an insect cell.

3. The glucocerebrosidase of claim 1, produced by a mammalian cell.

4. The glucocerebrosidase of claim 3, produced by a Chinese hamster ovary cell.

5. Recombinant enzymatically active glucocerebrosidase comprising at least one exposed mannose residue, said glucocerebrosidase being capable of binding with a human mannose receptor protein.

6. The recombinant enzymatically active glucocerebrosidase of claim 1 or 5, wherein said glucocerebrosidase has an amino acid sequence with at least 95% homology to an amino acid sequence of a primate glucocerebrosidase.

7. The recombinant enzymatically active glucocerebrosidase of claim 6, wherein said primate glucocerebrosidase is human glucocerebrosidase.

8. The recombinant enzymatically active glucocerebrosidase of claim 5, comprising at least two exposed mannose residues.

9. The recombinant enzymatically active glucocerebrosidase of claim 8, comprising a carbohydrate moiety having between 3 and 9 exposed mannose residues.

10. The recombinant enzymatically active glucocerebrosidase of claim 9, wherein said between 3 and 9 mannose residues are arranged in a Man_3 to Man_9 structure.

11. The recombinant enzymatically active glucocerebrosidase of claim 5, wherein said receptor protein is a human mannose receptor protein occurring naturally in a phagocytic cell.

12. The recombinant enzymatically active glucocerebrosidase of claim 5, wherein said glucocerebrosidase is produced within an insect cell.

13. The recombinant enzymatically active glucocerebrosidase of claim 5, wherein said glucocerebrosidase is produced within a mammalian cell.

14. A eukaryotic cell comprising nucleic acid encoding enzymatically active glucocerebrosidase, wherein said glucocerebrosidase is capable of specifically binding with a human mannose receptor protein.

15. The eukaryotic cell of claim 14, said cell being an insect cell.

16. The eukaryotic cell of claim 14, said cell being a mammalian cell.

17. The eukaryotic cell of claim 16, said mammalian cell being a Chinese hamster ovary cell.

18. The eukaryotic cell of claim 14, wherein said nucleic acid comprises DNA encoding human glucocerebrosidase.

19. The eukaryotic cell of claim 14, wherein said DNA lacks at least 50% of a naturally occurring region between the promoter of said glucocerebrosidase-encoding DNA and the ATG start site of said glucocerebrosidase-encoding DNA.

20. The eukaryotic cell of claim 19, wherein said cell is an insect cell.

21. The eukaryotic cell of claim 19, wherein said cell is a mammalian cell.

22. The eukaryotic cell of claim 21, said mammalian cell being a Chinese hamster ovary cell.

23. The insect cell of claim 15, wherein said nucleic acid is provided by pVL941.GCRD21.

24. The insect cell of claim 15, wherein said nucleic acid is provided by a vector comprising DNA encoding an amino acid sequence having at least 95% homology to an amino acid sequence of a naturally occurring glucocerebrosidase.

25. The insect cell of claim 24, wherein said nucleic acid is provided by pAc373.GCR2.2.

26. The insect cell of claim 24, wherein said naturally occurring glucocerebrosidase occurs naturally within a primate.

27. The insect cell of claim 26, wherein said naturally occurring glucocerebrosidase occurs naturally within a human.

28. The eukaryotic cell of claim 14, wherein said glucocerebrosidase comprises at least two exposed mannose residues.

29. The eukaryotic cell of claim 28, wherein said glucocerebrosidase comprises a carbohydrate moiety having between 3 and 9 mannose residues.

30. The eukaryotic cell of claim 29, wherein said between 3 and 9 mannose residues are arranged in a Man_3 to Man_9 structure.

31. An insect comprising a cell of claim 15.

32. A mammal comprising a cell of claim 16.

33. A method for producing enzymatically active glucocerebrosidase comprising the steps of:

introducing nucleic acid encoding glucocerebrosidase into a eukaryotic cell;

causing said cell to express said glucocerebrosidase; and

purifying said glucocerebrosidase.

34. The method of claim 33 wherein said eukaryotic cell is an insect cell.

35. The method of claim 33 wherein said eukaryotic cell is a mammalian cell.

36. The method of claim 35 wherein said mammalian cell is a CHO cell.

37. The method of claim 33 wherein the step of causing said cell to express said glucocerebrosidase comprises culturing said cell in a culture medium in vitro.

38. The method of claim 34 wherein the step of causing said cell to express said glucocerebrosidase comprises growing said cell in vivo within an insect.

39. The method of claim 35 wherein the step of causing said cell to express said glucocerebrosidase comprises growing said cell in vivo within a mammal.

40. The method of claim 37 wherein the step of purifying said glucocerebrosidase comprises purifying said glucocerebrosidase from said culture medium.

41. The method of claim 33 wherein the step of purifying said glucocerebrosidase comprises disrupting said cell to form a cellular extract and purifying said glucocerebrosidase from said cellular extract.

42. The mammalian cell of claim 16 wherein said cell is transformed with any plasmid selected from the group pGB20, pGB37, and pGB42.

43. The mammalian cell of claim 16 wherein said cell is cotransformed with plasmid pGB34 and any plasmid selected from the group pGB20, pGB37, and pGB42.

44. The method of claim 37 wherein the pH of said culture medium is between about pH 6.5 and pH 7.2.

45. The method of claim 44 wherein the pH of said culture medium is between about pH 6.6 and pH 6.8.

46. The method of claim 37 wherein said culture medium contains O_2 in an amount below about 50% saturation and sufficient to maintain the cells.

47. The method of claim 37 wherein said culture medium contains O_2 in an amount between about 20% saturation and about 30% saturation.